



SEQUENCE LISTING

<110> Bruck, Claudine
Godart, Stephane Andre Georges
Marc-Hand, Martine

<120> Fusion Proteins Comprising HIV-1 TAT
and/or Nef Proteins

<130> B45110

<140> 09/509,239

<141> 2000-03-23

<150> PCT/EP98/06040

<151> 1998-09-17

<150> GB 9720585.0

<151> 1997-09-26

<160> 27

<170> FastSEQ for Windows Version 3.0

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<213> Pichia pastoris

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<213> *Pichia pastoris*

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24

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<213> *Pichia pastoris*

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cgtggtgcta gcggttattt accagagcat acgtagaat ctaaagcact tgcttttgca	180
caacaggctg attattttaga gcaagattta gcaatgacta aggatggctg tttagtggtt	240
attcacgata acttttttaga tggcttgact gatgttgcca aaaaattccc acatcgatc	300
cgtaaagatg gccgttacta tgtcatcgac tttaccttaa aagaaattca aagtttagaa	360
atgacagaaa actttgaaac catggccacg tgtgatcaga gctcaactag tggccaccat	420
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<210> 7

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<212> PRT

<213> *Pichia pastoris*

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			20					25					30		
Ser	Asp	Lys	Ile	Ile	Ile	Ala	His	Arg	Gly	Ala	Ser	Gly	Tyr	Leu	Pro
	35						40					45			
Glu	His	Thr	Leu	Glu	Ser	Lys	Ala	Leu	Ala	Phe	Ala	Gln	Gln	Ala	Asp
	50					55					60				
Tyr	Leu	Glu	Gln	Asp	Leu	Ala	Met	Thr	Lys	Asp	Gly	Arg	Leu	Val	Val
65				70					75					80	
Ile	His	Asp	His	Phe	Leu	Asp	Gly	Leu	Thr	Asp	Val	Ala	Lys	Lys	Phe
			85					90					95		
Pro	His	Arg	His	Arg	Lys	Asp	Gly	Arg	Tyr	Tyr	Val	Ile	Asp	Phe	Thr
		100						105					110		
Leu	Lys	Glu	Ile	Gln	Ser	Leu	Glu	Met	Thr	Glu	Asn	Phe	Glu	Thr	Met
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<210> 8

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<212> DNA

<213> Pichia pastoris

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ggagcaatca	caagtagcaa	tacagcagct	accaatgctg	cttgtgcctg	gctagaagca	180
caagaggagg	aggaggtggg	ttttccagtc	acacctcagg	tacctttaag	accaatgact	240
tacaaggcag	ctgtagatct	tagccacttt	ttaaaagaaa	aggggggact	ggaagggcta	300
attcactccc	aacgaagaca	agatatcctt	gatctgtgga	tctaccacac	acaaggctac	360
ttccctgatt	ggcagaacta	cacaccaggg	ccaggggtca	gatatccact	gacctttgga	420
tggtgctaca	agctagtacc	agttgagcca	gataaggtag	aagaggccaa	taaaggagag	480
aacaccagct	tgttacaccc	tgtgagcctg	catggaatgg	atgacctga	gagagaagtg	540
ttagagtgga	ggtttgacag	ccgcctagca	tttcatcacg	tggcccgaga	gctgcatccg	600
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<210> 9

<211> 215

<212> PRT

<213> Pichia pastoris

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Arg	Glu	Arg	Met	Arg	Arg	Ala	Glu	Pro	Ala	Ala	Asp	Gly	Val	Gly	Ala
			20					25					30		
Ala	Ser	Arg	Asp	Leu	Glu	Lys	His	Gly	Ala	Ile	Thr	Ser	Ser	Asn	Thr
		35					40					45			
Ala	Ala	Thr	Asn	Ala	Ala	Cys	Ala	Trp	Leu	Glu	Ala	Gln	Glu	Glu	Glu
		50				55					60				
Glu	Val	Gly	Phe	Pro	Val	Thr	Pro	Gln	Val	Pro	Leu	Arg	Pro	Met	Thr
65					70				75					80	
Tyr	Lys	Ala	Ala	Val	Asp	Leu	Ser	His	Phe	Leu	Lys	Glu	Lys	Gly	Gly
			85					90						95	
Leu	Glu	Gly	Leu	Ile	His	Ser	Gln	Arg	Arg	Gln	Asp	Ile	Leu	Asp	Leu
		100					105					110			
Trp	Ile	Tyr	His	Thr	Gln	Gly	Tyr	Phe	Pro	Asp	Trp	Gln	Asn	Tyr	Thr
		115				120						125			
Pro	Gly	Pro	Gly	Val	Arg	Tyr	Pro	Leu	Thr	Phe	Gly	Trp	Cys	Tyr	Lys
	130				135					140					
Leu	Val	Pro	Val	Glu	Pro	Asp	Lys	Val	Glu	Glu	Ala	Asn	Lys	Gly	Glu
145				150					155					160	
Asn	Thr	Ser	Leu	Leu	His	Pro	Val	Ser	Leu	His	Gly	Met	Asp	Asp	Pro
			165					170					175		
Glu	Arg	Glu	Val	Leu	Glu	Trp	Arg	Phe	Asp	Ser	Arg	Leu	Ala	Phe	His
		180					185					190			
His	Val	Ala	Arg	Glu	Leu	His	Pro	Glu	Tyr	Phe	Lys	Asn	Cys	Thr	Ser
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<210> 10

<211> 288

<212> DNA

<213> *Pichia pastoris*

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aaagccttag gcatctccta tggcaggaag aagcggagac agcgacgaag acctcctcaa	180
ggcagtcaga ctcatcaagt ttctctatca aagcaacca cctcccaatc ccgagggggac	240
ccgacaggcc cgaaggaaac tagtggccac catcaccatc accattaa	288

<210> 11

<211> 95

<212> PRT

<213> *Pichia pastoris*

<400> 11

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20 25 30
His Cys Gln Val Cys Phe Ile Thr Lys Ala Leu Gly Ile Ser Tyr Gly
35 40 45
Arg Lys Lys Arg Arg Gln Arg Arg Arg Pro Pro Gln Gly Ser Gln Thr
50 55 60
His Gln Val Ser Leu Ser Lys Gln Pro Thr Ser Gln Ser Arg Gly Asp
65 70 75 80
Pro Thr Gly Pro Lys Glu Thr Ser Gly His His His His His His
85 90 95

<210> 12

<211> 909

<212> DNA

<213> *Pichia pastoris*

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ggagcaatca caagtagcaa tacagcagct accaatgctg cttgtgctg gctagaagca 180
caagaggagg aggaggtggg ttttccagtc acacctcagg tacctttaag accaatgact 240
tacaaggcag ctgtagatct tagccacttt ttaaaagaaa aggggggact ggaagggcta 300
attcactccc aacgaagaca agatatcctt gatctgtgga tctaccacac acaaggctac 360
ttccctgatt ggcagaacta cacaccaggg ccaggggtca gatatccact gacctttgga 420
tggtgctaca agctagtacc agttgagcca gataaggtag aagaggccaa taaaggagag 480
aacaccagct tgttacaccc tgtgagcctg catggaatgg atgaccctga gagagaagtg 540
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ccaggaagtc agcctaaaac tgcttgtagc aattgctatt gtaaaaagtg ttgctttcat 720
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cagcgacgaa gacctcctca aggcagtcag actcatcaag tttctctatc aaagcaaccc 840
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<210> 13

<211> 302

<212> PRT

<213> Pichia pastoris

<400> 13

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    35           40           45
Ala Ala Thr Asn Ala Ala Cys Ala Trp Leu Glu Ala Gln Glu Glu Glu
    50           55           60
Glu Val Gly Phe Pro Val Thr Pro Gln Val Pro Leu Arg Pro Met Thr
65           70           75           80
Tyr Lys Ala Ala Val Asp Leu Ser His Phe Leu Lys Glu Lys Gly Gly
    85           90           95
Leu Glu Gly Leu Ile His Ser Gln Arg Arg Gln Asp Ile Leu Asp Leu
    100          105          110
Trp Ile Tyr His Thr Gln Gly Tyr Phe Pro Asp Trp Gln Asn Tyr Thr
    115          120          125
Pro Gly Pro Gly Val Arg Tyr Pro Leu Thr Phe Gly Trp Cys Tyr Lys
    130          135          140
Leu Val Pro Val Glu Pro Asp Lys Val Glu Glu Ala Asn Lys Gly Glu
145          150          155          160
Asn Thr Ser Leu Leu His Pro Val Ser Leu His Gly Met Asp Asp Pro
    165          170          175
Glu Arg Glu Val Leu Glu Trp Arg Phe Asp Ser Arg Leu Ala Phe His
    180          185          190
His Val Ala Arg Glu Leu His Pro Glu Tyr Phe Lys Asn Cys Thr Ser
    195          200          205
Glu Pro Val Asp Pro Arg Leu Glu Pro Trp Lys His Pro Gly Ser Gln
    210          215          220
Pro Lys Thr Ala Cys Thr Asn Cys Tyr Cys Lys Lys Cys Cys Phe His
225          230          235          240
Cys Gln Val Cys Phe Ile Thr Lys Ala Leu Gly Ile Ser Tyr Gly Arg
    245          250          255
Lys Lys Arg Arg Gln Arg Arg Arg Pro Pro Gln Gly Ser Gln Thr His
    260          265          270
Gln Val Ser Leu Ser Lys Gln Pro Thr Ser Gln Ser Arg Gly Asp Pro
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Thr Gly Pro Lys Glu Thr Ser Gly His His His His His His
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<210> 14

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<212> DNA

<213> *Pichia pastoris*

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cgtggtgcta gcggttattt accagagcat acgttagaat ctaaagcact tgcttttgca      180
caacaggctg attattttaga gcaagattta gcaatgacta aggatggctg tttagtggtt      240
attcacgata acttttttaga tggcttgact gatgttgcca aaaaattccc acatcgtcac      300
cgtaaagatg gccgttacta tgtcatcgac ttacacctaa aagaaattca aagtttagaa      360
atgacagaaa actttgaaac catgggtggc aagtgggtcaa aaagtagtgt gggttgatgg      420
cctactgtaa gggaaagaat gagacgagct gagccagcag cagatggggg gggagcagca      480
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gcttggtgct ggctagaagc acaagaggag gaggaggtgg gttttccagt cacacctcag      600
gtacctttta gaccaatgac ttacaaggca gctgtagatc ttagccactt tttaaaagaa      660
aaggggggac tgggaagggt aattcactcc caacgaagac aagatatacct tgatctgtgg      720
atctaccaca cacaaggcta cttccctgat tggcagaact acacaccagg gccaggggtc      780
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gaagaggcca ataaaggaga gaacaccagc ttgttacacc ctgtgagcct gcatggaatg      900
gatgaccctg agagagaagt gttagagtgg aggtttgaca gccgcctagc atttcacac      960
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<210> 15

<211> 324

<212> PRT

<213> *Pichia pastoris*

<400> 15

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Thr Leu Glu Ser Lys Ala Leu Ala Phe Ala Gln Gln Ala Asp Tyr Leu
 35           40           45
Glu Gln Asp Leu Ala Met Thr Lys Asp Gly Arg Leu Val Val Ile His
 50           55           60
Asp His Phe Leu Asp Gly Leu Thr Asp Val Ala Lys Lys Phe Pro His
 65           70           75           80
Arg His Arg Lys Asp Gly Arg Tyr Tyr Val Ile Asp Phe Thr Leu Lys
 85           90           95
Glu Ile Gln Ser Leu Glu Met Thr Glu Asn Phe Glu Thr Met Gly Gly
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100	105	110
Lys Trp Ser Lys Ser Ser Val Val Gly Trp Pro Thr Val Arg Glu Arg		
115	120	125
Met Arg Arg Ala Glu Pro Ala Ala Asp Gly Val Gly Ala Ala Ser Arg		
130	135	140
Asp Leu Glu Lys His Gly Ala Ile Thr Ser Ser Asn Thr Ala Ala Thr		
145	150	155
Asn Ala Ala Cys Ala Trp Leu Glu Ala Gln Glu Glu Glu Glu Val Gly		
165	170	175
Phe Pro Val Thr Pro Gln Val Pro Leu Arg Pro Met Thr Tyr Lys Ala		
180	185	190
Ala Val Asp Leu Ser His Phe Leu Lys Glu Lys Gly Gly Leu Glu Gly		
195	200	205
Leu Ile His Ser Gln Arg Arg Gln Asp Ile Leu Asp Leu Trp Ile Tyr		
210	215	220
His Thr Gln Gly Tyr Phe Pro Asp Trp Gln Asn Tyr Thr Pro Gly Pro		
225	230	235
Gly Val Arg Tyr Pro Leu Thr Phe Gly Trp Cys Tyr Lys Leu Val Pro		
245	250	255
Val Glu Pro Asp Lys Val Glu Glu Ala Asn Lys Gly Glu Asn Thr Ser		
260	265	270
Leu Leu His Pro Val Ser Leu His Gly Met Asp Asp Pro Glu Arg Glu		
275	280	285
Val Leu Glu Trp Arg Phe Asp Ser Arg Leu Ala Phe His His Val Ala		
290	295	300
Arg Glu Leu His Pro Glu Tyr Phe Lys Asn Cys Thr Ser Gly His His		
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His His His His		

<210> 16

<211> 1290

<212> DNA

<213> Pichia pastoris

<400> 16

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cgtggtgcta gcggttattt accagagcat acgttagaat ctaaagcact tgcgtttgca	180
caacaggctg attatttaga gcaagattta gcaatgacta aggatggtcg tttagtgggt	240
attcacgac acttttttaga tggcttgact gatgttgcca aaaaattccc acatcgatcat	300
cgtaaagatg gccgttacta tgatcatcgac tttaccttaa aagaaattca aagtttagaa	360
atgacagaaa actttgaaac catgggtggc aagtgggtcaa aaagtagtgt gggttgatgg	420


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cctactgtaa gggaaagaat gagacgagct gagccagcag cagatgggggt gggagcagca      480
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gcttgtgcct ggctagaagc acaagaggag gaggaggtgg gttttccagt cacacctcag      600
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aagggggggac tggaaggggt aattcactcc caacgaagac aagatatacct tgatctgtgg----- 720
atctaccaca cacaaggcta ctccctgat tggcagaact acacaccagg gccagggggtc      780
agatatccac tgacctttgg atggtgctac aagctagtag cagttgagcc agataaggta      840
gaagaggcca ataaaggaga gaacaccagc ttgttacacc ctgtgagcct gcatggaatg      900
gatgaccctg agagagaagt gttagagtgg aggtttgaca gccgcctagc atttcatcac      960
gtggcccgag agctgcatcc ggagtacttc aagaactgca ctagtgagcc agtagatcct    1020
agactagagc cctggaagca tccaggaagt cagcctaaaa ctgcttgtag caattgctat    1080
tgtaaaaagt gttgctttca ttgccaagtt tgtttcataa caaaagcctt aggcattctcc    1140
tatggcagga agaagcggag acagcgacga agacctctc aaggcagtca gactcatcaa    1200
gtttctctat caaagcaacc cacctcccaa tcccaggggg acccgacagg cccgaaggaa    1260
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<210> 17

<211> 411

<212> PRT

<213> *Pichia pastoris*

<400> 17

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Thr Leu Glu Ser Lys Ala Leu Ala Phe Ala Gln Gln Ala Asp Tyr Leu
      35              40              45
Glu Gln Asp Leu Ala Met Thr Lys Asp Gly Arg Leu Val Val Ile His
      50              55              60
Asp His Phe Leu Asp Gly Leu Thr Asp Val Ala Lys Lys Phe Pro His
      65              70              75              80
Arg His Arg Lys Asp Gly Arg Tyr Tyr Val Ile Asp Phe Thr Leu Lys
      85              90              95
Glu Ile Gln Ser Leu Glu Met Thr Glu Asn Phe Glu Thr Met Gly Gly
      100             105             110
Lys Trp Ser Lys Ser Ser Val Val Gly Trp Pro Thr Val Arg Glu Arg
      115             120             125
Met Arg Arg Ala Glu Pro Ala Ala Asp Gly Val Gly Ala Ala Ser Arg
      130             135             140
Asp Leu Glu Lys His Gly Ala Ile Thr Ser Ser Asn Thr Ala Ala Thr
      145             150             155             160
Asn Ala Ala Cys Ala Trp Leu Glu Ala Gln Glu Glu Glu Glu Val Gly

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				165						170						175			
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				180						185						190			
Ala	Val	Asp	Leu	Ser	His	Phe	Leu	Lys	Glu	Lys	Gly	Gly	Leu	Glu	Gly				
		195						200					205						
Leu	Ile	His	Ser	Gln	Arg	Arg	Gln	Asp	Ile	Leu	Asp	Leu	Trp	Ile	Tyr				
	210						215					220							
His	Thr	Gln	Gly	Tyr	Phe	Pro	Asp	Trp	Gln	Asn	Tyr	Thr	Pro	Gly	Pro				
225						230					235				240				
Gly	Val	Arg	Tyr	Pro	Leu	Thr	Phe	Gly	Trp	Cys	Tyr	Lys	Leu	Val	Pro				
				245					250					255					
Val	Glu	Pro	Asp	Lys	Val	Glu	Glu	Ala	Asn	Lys	Gly	Glu	Asn	Thr	Ser				
				260					265					270					
Leu	Leu	His	Pro	Val	Ser	Leu	His	Gly	Met	Asp	Asp	Pro	Glu	Arg	Glu				
		275						280					285						
Val	Leu	Glu	Trp	Arg	Phe	Asp	Ser	Arg	Leu	Ala	Phe	His	His	Val	Ala				
		290						295					300						
Arg	Glu	Leu	His	Pro	Glu	Tyr	Phe	Lys	Asn	Cys	Thr	Ser	Glu	Pro	Val				
305						310					315				320				
Asp	Pro	Arg	Leu	Glu	Pro	Trp	Lys	His	Pro	Gly	Ser	Gln	Pro	Lys	Thr				
				325						330					335				
Ala	Cys	Thr	Asn	Cys	Tyr	Cys	Lys	Lys	Cys	Cys	Phe	His	Cys	Gln	Val				
				340					345					350					
Cys	Phe	Ile	Thr	Lys	Ala	Leu	Gly	Ile	Ser	Tyr	Gly	Arg	Lys	Lys	Arg				
		355						360					365						
Arg	Gln	Arg	Arg	Arg	Pro	Pro	Gln	Gly	Ser	Gln	Thr	His	Gln	Val	Ser				
		370					375					380							
Leu	Ser	Lys	Gln	Pro	Thr	Ser	Gln	Ser	Arg	Gly	Asp	Pro	Thr	Gly	Pro				
385						390					395				400				
Lys	Glu	Thr	Ser	Gly	His	His	His	His	His	His									
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<210> 18

<211> 981

<212> DNA

<213> *Pichia pastoris*

<400> 18

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cttgcgtttg	cacaacaggc	tgattattta	gagcaagatt	tagcaatgac	taaggatggt	180
cgtttagtgg	ttattcacga	tcacttttta	gatggcttga	ctgatgttgc	gaaaaaattc	240
ccacatcgtc	atcgtaaaga	tggccgttac	tatgtcatcg	actttacctt	aaaagaaatt	300

caaagtttag	aaatgacaga	aaactttgaa	accatgggtg	gcaagtgggc	aaaaagtagt	360
gtgggttgat	ggcctactgt	aagggaaaga	atgagacgag	ctgagccagc	agcagatggg	420
gtgggagcag	catctcgaga	cctggaaaaa	catggagcaa	tcacaagtag	caatacagca	480
gctaccaatg	ctgcttgtgc	ctggctagaa	gcacaagagg	aggaggaggt	gggttttcca	540
gtcacacctc	aggtaccttt	aagaaccaatg	acttacaagg	cagctgtaga	tcttagccac	600
tttttaaaag	aaaagggggg	actggaaggg	ctaattcact	cccaacgaag	acaagatatc	660
cttgatctgt	ggatctacca	cacacaaggc	tacttccttg	attggcagaa	ctacacacca	720
gggccagggg	tcagatatcc	actgaccttt	ggatgggtgct	acaagctagt	accagttgag	780
ccagataagg	tagaagaggc	caataaagga	gagaacacca	gcttggttaca	ccctgtgagc	840
ctgcatggaa	tggatgaccc	tgagagagaa	gtgtagtagt	ggaggtttga	cagccgccta	900
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<211> 326

<212> PRT

<213> *Pichia pastoris*

<400> 19

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Ser	Asp	Lys	Ile	Ile	Ile	Ala	His	Arg	Gly	Ala	Ser	Gly	Tyr	Leu	Pro	
			20					25					30			
Glu	His	Thr	Leu	Glu	Ser	Lys	Ala	Leu	Ala	Phe	Ala	Gln	Gln	Ala	Asp	
		35					40					45				
Tyr	Leu	Glu	Gln	Asp	Leu	Ala	Met	Thr	Lys	Asp	Gly	Arg	Leu	Val	Val	
	50					55					60					
Ile	His	Asp	His	Phe	Leu	Asp	Gly	Leu	Thr	Asp	Val	Ala	Lys	Lys	Phe	
65				70				75						80		
Pro	His	Arg	His	Arg	Lys	Asp	Gly	Arg	Tyr	Tyr	Val	Ile	Asp	Phe	Thr	
				85				90						95		
Leu	Lys	Glu	Ile	Gln	Ser	Leu	Glu	Met	Thr	Glu	Asn	Phe	Glu	Thr	Met	
			100					105					110			
Gly	Gly	Lys	Trp	Ser	Lys	Ser	Ser	Val	Val	Gly	Trp	Pro	Thr	Val	Arg	
		115				120						125				
Glu	Arg	Met	Arg	Arg	Ala	Glu	Pro	Ala	Ala	Asp	Gly	Val	Gly	Ala	Ala	
	130					135					140					
Ser	Arg	Asp	Leu	Glu	Lys	His	Gly	Ala	Ile	Thr	Ser	Ser	Asn	Thr	Ala	
145					150				155					160		
Ala	Thr	Asn	Ala	Ala	Cys	Ala	Trp	Leu	Glu	Ala	Gln	Glu	Glu	Glu	Glu	
				165					170				175			
Val	Gly	Phe	Pro	Val	Thr	Pro	Gln	Val	Pro	Leu	Arg	Pro	Met	Thr	Tyr	
			180					185					190			

Lys Ala Ala Val Asp Leu Ser His Phe Leu Lys Glu Lys Gly Gly Leu
 195 200 205
 Glu Gly Leu Ile His Ser Gln Arg Arg Gln Asp Ile Leu Asp Leu Trp
 210 215 220
 Ile Tyr His Thr Gln Gly Tyr Phe Pro Asp Trp Gln Asn Tyr Thr Pro
 225 230 235 240
 Gly Pro Gly Val Arg Tyr Pro Leu Thr Phe Gly Trp Cys Tyr Lys Leu
 245 250 255
 Val Pro Val Glu Pro Asp Lys Val Glu Glu Ala Asn Lys Gly Glu Asn
 260 265 270
 Thr Ser Leu Leu His Pro Val Ser Leu His Gly Met Asp Asp Pro Glu
 275 280 285
 Arg Glu Val Leu Glu Trp Arg Phe Asp Ser Arg Leu Ala Phe His His
 290 295 300
 Val Ala Arg Glu Leu His Pro Glu Tyr Phe Lys Asn Cys Thr Ser Gly
 305 310 315 320
 His His His His His His
 325

<210> 20

<211> 1242

<212> DNA

<213> *Pichia pastoris*

<400> 20

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cttgcgtttg cacaacaggc tgattattta gagcaagatt tagcaatgac taaggatggt	180
cgtttagtgg ttattcacga tcacttttta gatggcttga ctgatgttgc gaaaaaattc	240
ccacatcgtc atcgtaaaga tggccgttac tatgtcatcg actttacctt aaaagaaatt	300
caaagtttag aaatgacaga aaactttgaa accatgggtg gcaagtgggtc aaaaagtagt	360
gtggttggtg ggccactgt aagggaaga atgagacgag ctgagccagc agcagatggg	420
gtgggagcag catctcgaga cctggaaaaa catggagcaa tcacaagtag caatacagca	480
gctaccaatg ctgcttgtgc ctggctagaa gcacaagagg aggaggagggt gggttttcca	540
gtcacacctc aggtaccttt aagaccaatg acttacaagg cagctgtaga tcttagccac	600
tttttaaaag aaaagggggg actggaaggg ctaattcact cccaacgaag acaagatatc	660
cttgatctgt ggatctacca cacacaaggc tacttccttg attggcagaa ctacacacca	720
gggccagggg tcagatatcc actgaccttt ggatggtgct acaagctagt accagttgag	780
ccagataagg tagaagaggc caataaagga gagaacacca gcttggttaca ccctgtgagc	840
ctgcatggaa tggatgacct tgagagagaa gtgtagagt ggaggtttga cagccgccta	900
gcatttcatc acgtggcccg agagctgcat ccggagtact tcaagaactg cactagttag	960
ccagtagatc ctagactaga gccctggaag catccaggaa gtcagcctaa aactgcttgt	1020
accaattgct attgtaaaaa gtgttgcttt cattgccaag tttgtttcat aacaaaagcc	1080

ttaggcatct cctatggcag gaagaagcgg agacagcgac gaagacctcc tcaaggcagt	1140
cagactcatc aagtttctct atcaaagcaa cccacctccc aatcccgagg ggacccgaca	1200
ggcccgaagg aaactagtgg ccaccatcac catcaccatt aa	1242

<210> 21

<211> 413

<212> PRT

<213> *Pichia pastoris*

<400> 21

Met	Asp	Pro	Ser	Ser	His	Ser	Ser	Asn	Met	Ala	Asn	Thr	Gln	Met	Lys
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Ser	Asp	Lys	Ile	Ile	Ile	Ala	His	Arg	Gly	Ala	Ser	Gly	Tyr	Leu	Pro
			20					25					30		
Glu	His	Thr	Leu	Glu	Ser	Lys	Ala	Leu	Ala	Phe	Ala	Gln	Gln	Ala	Asp
		35					40					45			
Tyr	Leu	Glu	Gln	Asp	Leu	Ala	Met	Thr	Lys	Asp	Gly	Arg	Leu	Val	Val
	50					55					60				
Ile	His	Asp	His	Phe	Leu	Asp	Gly	Leu	Thr	Asp	Val	Ala	Lys	Lys	Phe
65				70					75					80	
Pro	His	Arg	His	Arg	Lys	Asp	Gly	Arg	Tyr	Tyr	Val	Ile	Asp	Phe	Thr
			85						90					95	
Leu	Lys	Glu	Ile	Gln	Ser	Leu	Glu	Met	Thr	Glu	Asn	Phe	Glu	Thr	Met
			100					105					110		
Gly	Gly	Lys	Trp	Ser	Lys	Ser	Ser	Val	Val	Gly	Trp	Pro	Thr	Val	Arg
		115				120						125			
Glu	Arg	Met	Arg	Arg	Ala	Glu	Pro	Ala	Ala	Asp	Gly	Val	Gly	Ala	Ala
	130					135					140				
Ser	Arg	Asp	Leu	Glu	Lys	His	Gly	Ala	Ile	Thr	Ser	Ser	Asn	Thr	Ala
145					150					155				160	
Ala	Thr	Asn	Ala	Ala	Cys	Ala	Trp	Leu	Glu	Ala	Gln	Glu	Glu	Glu	Glu
			165						170					175	
Val	Gly	Phe	Pro	Val	Thr	Pro	Gln	Val	Pro	Leu	Arg	Pro	Met	Thr	Tyr
		180					185						190		
Lys	Ala	Ala	Val	Asp	Leu	Ser	His	Phe	Leu	Lys	Glu	Lys	Gly	Gly	Leu
	195						200						205		
Glu	Gly	Leu	Ile	His	Ser	Gln	Arg	Arg	Gln	Asp	Ile	Leu	Asp	Leu	Trp
	210					215					220				
Ile	Tyr	His	Thr	Gln	Gly	Tyr	Phe	Pro	Asp	Trp	Gln	Asn	Tyr	Thr	Pro
225				230						235				240	
Gly	Pro	Gly	Val	Arg	Tyr	Pro	Leu	Thr	Phe	Gly	Trp	Cys	Tyr	Lys	Leu
			245						250					255	
Val	Pro	Val	Glu	Pro	Asp	Lys	Val	Glu	Glu	Ala	Asn	Lys	Gly	Glu	Asn

260	265	270
Thr Ser Leu Leu His Pro Val Ser Leu His Gly Met Asp Asp Pro Glu		
275	280	285
Arg Glu Val Leu Glu Trp Arg Phe Asp Ser Arg Leu Ala Phe His His		
290	295	300
Val Ala Arg Glu Leu His Pro Glu Tyr Phe Lys Asn Cys Thr Ser Glu		
305	310	315
Pro Val Asp Pro Arg Leu Glu Pro Trp Lys His Pro Gly Ser Gln Pro		
325	330	335
Lys Thr Ala Cys Thr Asn Cys Tyr Cys Lys Lys Cys Cys Phe His Cys		
340	345	350
Gln Val Cys Phe Ile Thr Lys Ala Leu Gly Ile Ser Tyr Gly Arg Lys		
355	360	365
Lys Arg Arg Gln Arg Arg Arg Pro Pro Gln Gly Ser Gln Thr His Gln		
370	375	380
Val Ser Leu Ser Lys Gln Pro Thr Ser Gln Ser Arg Gly Asp Pro Thr		
385	390	395
Gly Pro Lys Glu Thr Ser Gly His His His His His His		
405	410	

<210> 22

<211> 288

<212> DNA

<213> *Pichia pastoris*

<400> 22

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gcttgtacca attgctattg taaaaagtgt tgctttcatt gccaaagtttg tttcataaca	120
gctgccttag gcatctccta tggcaggaag aagcggagac agcgacgaag acctcctcaa	180
ggcagtcaga ctcatcaagt ttctctatca aagcaacca cctcccaatc caaaggggag	240
ccgacaggcc cgaaggaaac tagtggccac catcaccatc accattaa	288

<210> 23

<211> 95

<212> PRT

<213> *Pichia pastoris*

<400> 23

Met Glu Pro Val Asp Pro Arg Leu Glu Pro Trp Lys His Pro Gly Ser	
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Gln Pro Lys Thr Ala Cys Thr Asn Cys Tyr Cys Lys Lys Cys Cys Phe	
20	25
His Cys Gln Val Cys Phe Ile Thr Ala Ala Leu Gly Ile Ser Tyr Gly	

35 40 45
 Arg Lys Lys Arg Arg Gln Arg Arg Arg Pro Pro Gln Gly Ser Gln Thr
 50 55 60
 His Gln Val Ser Leu Ser Lys Gln Pro Thr Ser Gln Ser Lys Gly Glu
 65 70 75 80
 Pro Thr Gly Pro Lys Glu Thr Ser Gly His His His His His His
 85 90 95

<210> 24
 <211> 909
 <212> DNA
 <213> *Pichia pastoris*

<400> 24
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 agacgagctg agccagcagc agatgggggtg ggagcagcat ctgagacct ggaaaaacat 120
 ggagcaatca caagtagcaa tacagcagct accaatgctg cttgtgcctg gctagaagca 180
 caagaggagg aggaggtggg ttttccagtc acacctcagg tacctttaag accaatgact 240
 tacaaggcag ctgtagatct tagccacttt ttaaaagaaa agggggggact ggaagggcta 300
 attcactccc aacgaagaca agatatacctt gatctgtgga tctaccacac acaaggctac 360
 ttccctgatt ggcagaacta cacaccaggg ccaggggtca gatataccact gacctttgga 420
 tgggtgtaca agctagtacc agttgagcca gataaggtag aagaggccaa taaaggagag 480
 aacaccagct tgttacaccc tgtgagcctg catggaatgg atgacctga gagagaagtg 540
 ttagagtgga ggtttgacag ccgcctagca tttcatcacg tggcccgaga gctgcatccg 600
 gagtacttca agaactgcac tagtgagcca gtagatccta gactagagcc ctggaagcat 660
 ccaggaagtc agcctaaac tgcttgtagc aattgctatt gtaaaaagtg ttgctttcat 720
 tgccaagttt gtttcataac agctgcctta ggcatactct atggcaggaa gaagcggaga 780
 cagcgacgaa gacctcctca aggcagtcag actcatcaag tttctctatc aaagcaaccc 840
 acctccaat ccaaagggga gccgacaggc ccgaaggaaa ctagtggcca ccatcaccat 900
 caccattaa 909

<210> 25
 <211> 302
 <212> PRT
 <213> *Pichia pastoris*

<400> 25
 Met Gly Gly Lys Trp Ser Lys Ser Ser Val Val Gly Trp Pro Thr Val
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 20 25 30
 Ala Ser Arg Asp Leu Glu Lys His Gly Ala Ile Thr Ser Ser Asn Thr
 35 40 45

Ala Ala Thr Asn Ala Ala Cys Ala Trp Leu Glu Ala Gln Glu Glu Glu
 50 55 60
 Glu Val Gly Phe Pro Val Thr Pro Gln Val Pro Leu Arg Pro Met Thr
 65 70 75 80
 Tyr Lys Ala Ala Val Asp Leu Ser His Phe Leu Lys Glu Lys Gly Gly
 85 90 95
 Leu Glu Gly Leu Ile His Ser Gln Arg Arg Gln Asp Ile Leu Asp Leu
 100 105 110
 Trp Ile Tyr His Thr Gln Gly Tyr Phe Pro Asp Trp Gln Asn Tyr Thr
 115 120 125
 Pro Gly Pro Gly Val Arg Tyr Pro Leu Thr Phe Gly Trp Cys Tyr Lys
 130 135 140
 Leu Val Pro Val Glu Pro Asp Lys Val Glu Glu Ala Asn Lys Gly Glu
 145 150 155 160
 Asn Thr Ser Leu Leu His Pro Val Ser Leu His Gly Met Asp Asp Pro
 165 170 175
 Glu Arg Glu Val Leu Glu Trp Arg Phe Asp Ser Arg Leu Ala Phe His
 180 185 190
 His Val Ala Arg Glu Leu His Pro Glu Tyr Phe Lys Asn Cys Thr Ser
 195 200 205
 Glu Pro Val Asp Pro Arg Leu Glu Pro Trp Lys His Pro Gly Ser Gln
 210 215 220
 Pro Lys Thr Ala Cys Thr Asn Cys Tyr Cys Lys Lys Cys Cys Phe His
 225 230 235 240
 Cys Gln Val Cys Phe Ile Thr Ala Ala Leu Gly Ile Ser Tyr Gly Arg
 245 250 255
 Lys Lys Arg Arg Gln Arg Arg Arg Pro Pro Gln Gly Ser Gln Thr His
 260 265 270
 Gln Val Ser Leu Ser Lys Gln Pro Thr Ser Gln Ser Lys Gly Glu Pro
 275 280 285
 Thr Gly Pro Lys Glu Thr Ser Gly His His His His His His
 290 295 300

<210> 26

<211> 57

<212> DNA

<213> *Pichia pastoris*

<400> 26

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57

<210> 27

<211> 9

<212> PRT

<213> *Pichia pastoris*

<400> 27

Thr Ser Gly His His His His His His

1

5